



Outcome Measures for Nutrition Education with Low-Income Families: Some considerations

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Opportunities & challenges

Opportunities

Considerable resources available through this program: about \$200m in federal dollars plus equal amount in state, local & in-kind contributions

Challenges for evaluation

Many stake-holders: USDA, legislatures; partners; community groups, with differing expectations about

- What are they getting for their money?
- Is the program making a difference in the target population

Opportunities & challenges

Opportunities

Agreed on a goal:

To provide educational programs that increase, within a limited budget, likelihood of making healthful food choices consistent with the dietary advice in the Dietary Guidelines

- Focus on increasing fruits, vegetables & whole grains
- Eating lower fat foods more often
- Being physically active and maintaining a healthy weight
(FNS)

Opportunities & considerations



Opportunities

Agreed on objectives or core elements:

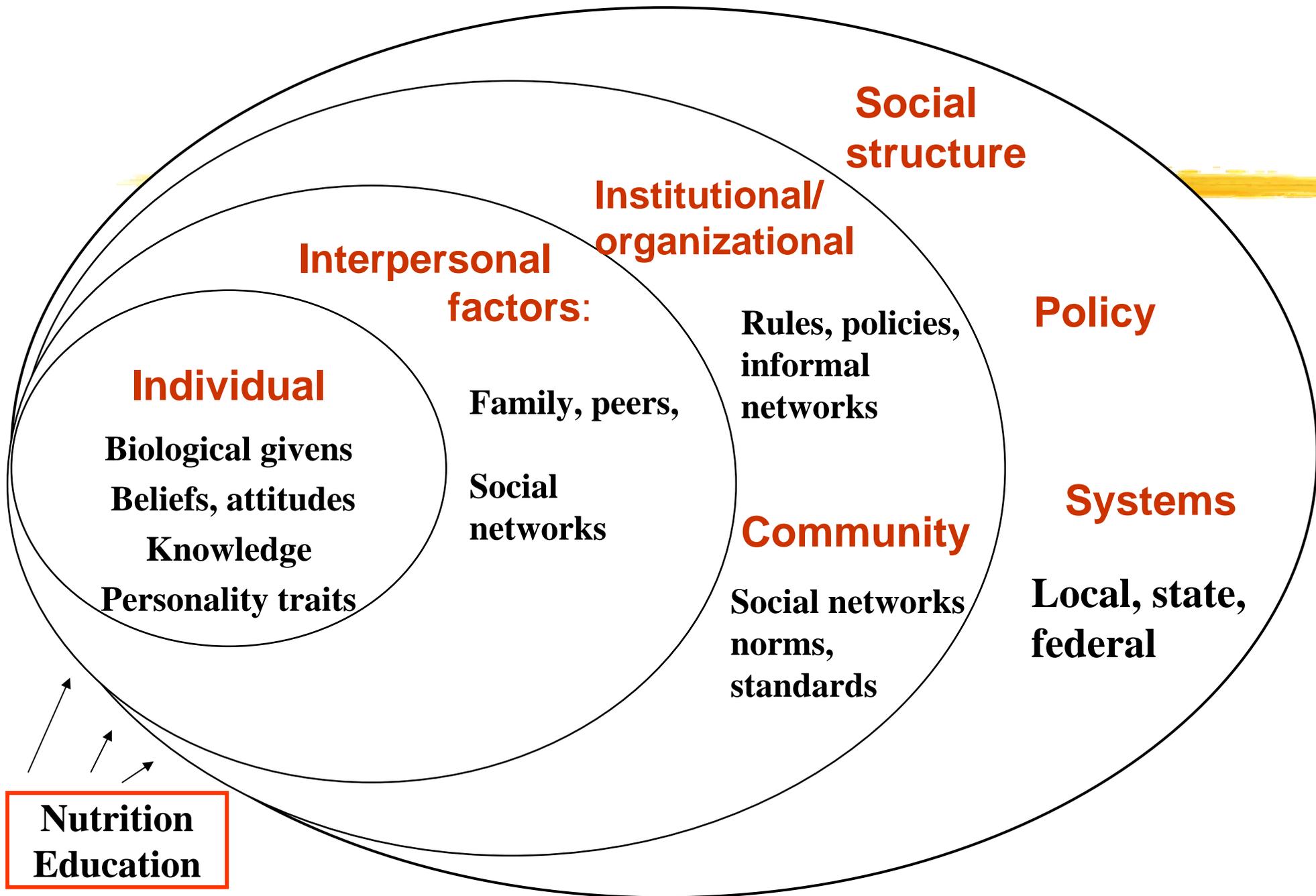
Dietary quality

Food security

Food safety

Food resource management/shopping behaviors

System & environmental changes



Opportunities & considerations

Opportunities

- Open, un-proscribed in terms of how to reach the target population
- Possibilities for creative, exciting new approaches
- Tremendous variety in the kinds of programs conducted in each state

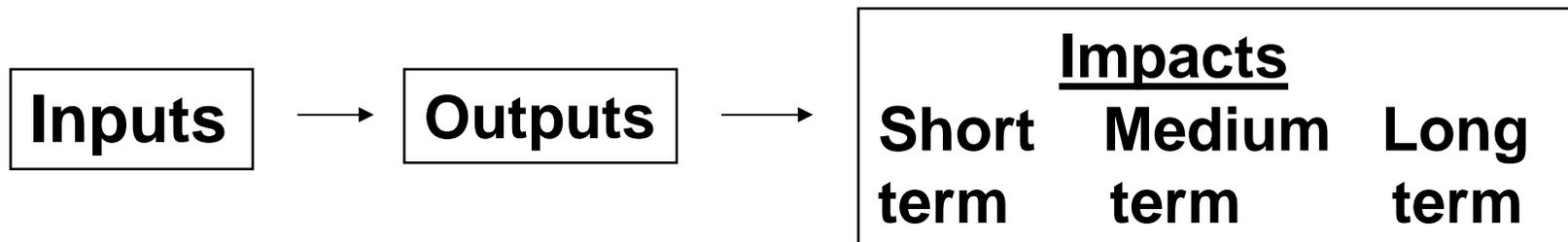
Challenges for evaluation:

- ◆ Diversity of programs means many different outcomes to measure
- ◆ Diversity of programs makes it difficult to make general claims for effectiveness

Opportunities & challenges

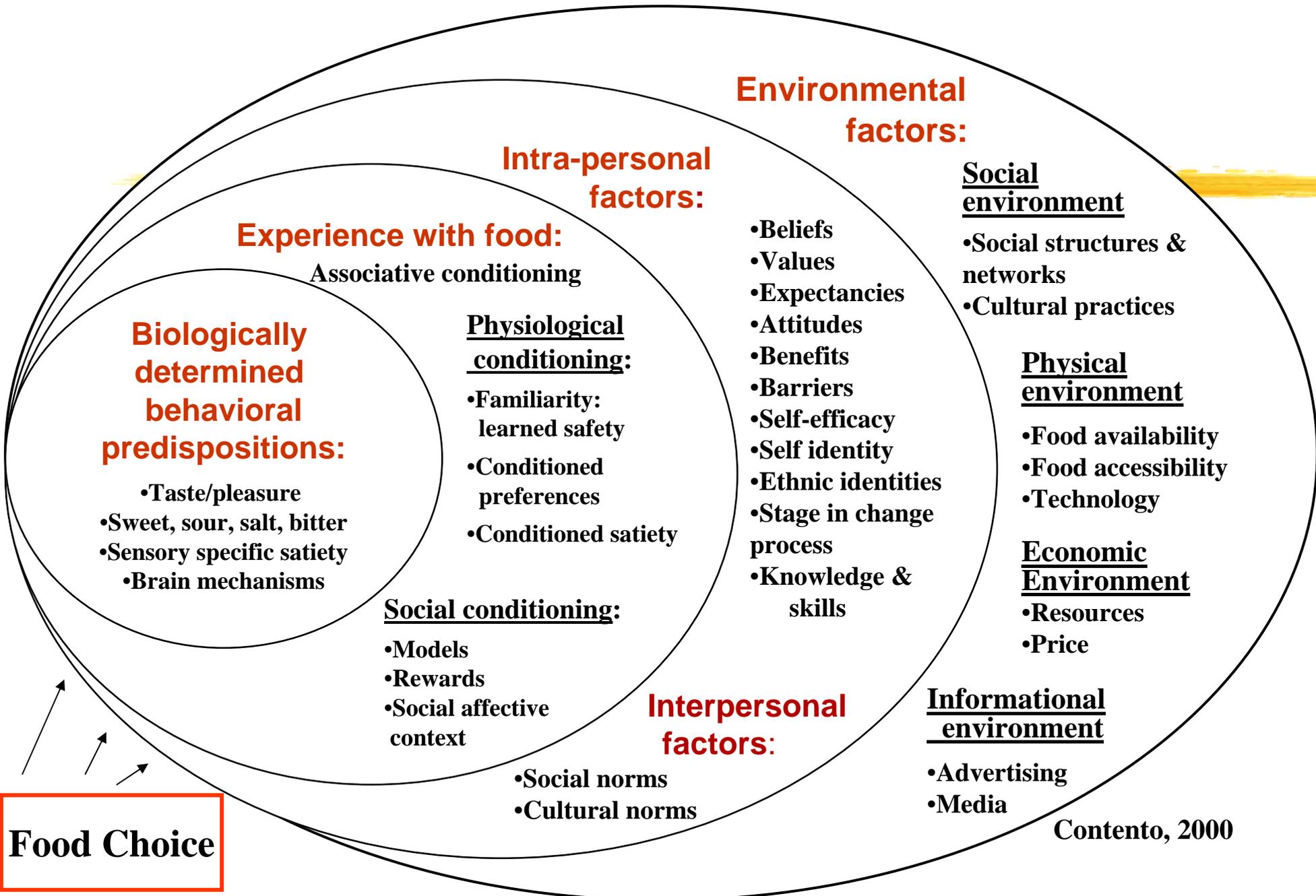
Opportunities

Agreed on a general planning and evaluation framework:



Challenge for evaluation

What to put in the impacts box



Biologically determined behavioral predispositions:

- Taste/pleasure
- Sweet, sour, salt, bitter
- Sensory specific satiety
- Brain mechanisms

Experience with food:

Associative conditioning

Physiological conditioning:

- Familiarity: learned safety
- Conditioned preferences
- Conditioned satiety

Social conditioning:

- Models
- Rewards
- Social affective context

Intra-personal factors:

Interpersonal factors:

- Social norms
- Cultural norms

Environmental factors:

Social environment

- Social structures & networks
- Cultural practices

Physical environment

- Food availability
- Food accessibility
- Technology

Economic Environment

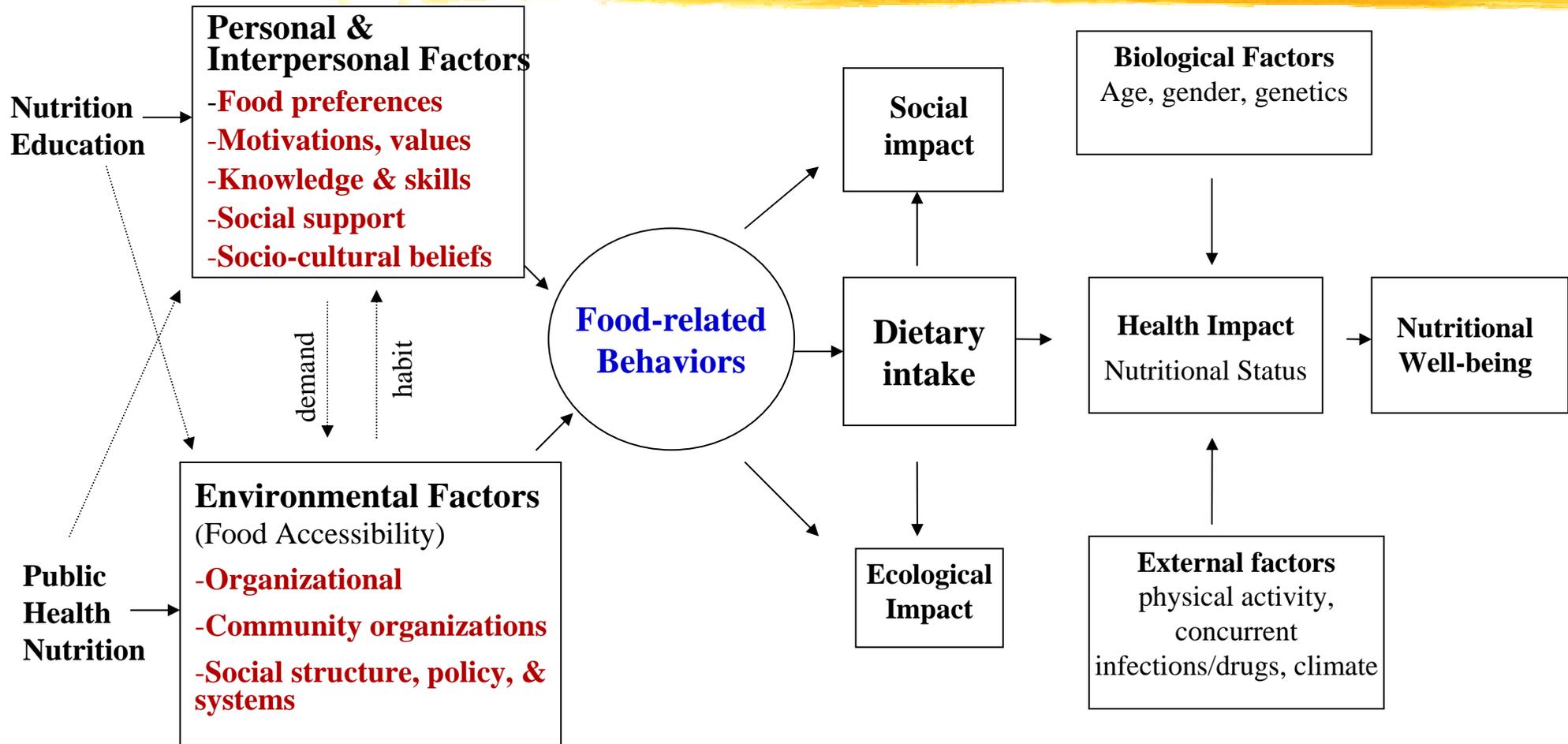
- Resources
- Price

Informational environment

- Advertising
- Media

Food Choice

Factors influencing nutritional well-being and role of nutrition education



Outcome evaluation measures

Dietary Intakes (68 studies)

24-hour dietary recalls

Analyzed for foods or food groups (7 studies)

Analyzed for fat, fiber, etc. intake (8 studies)

Analyzed for nutrients (2 studies)

Food records -- 3/4/7 day (4 studies)

Food frequencies

General (2 studies)

NCI or Harvard – fat, fiber, vitamins (14 studies)

Short - Fat intake (9 studies)

Short - Fruit & vegetable intakes (9 studies)

Data to 1999 (Contento et al., JNEB, 2002)

Outcome evaluation measures

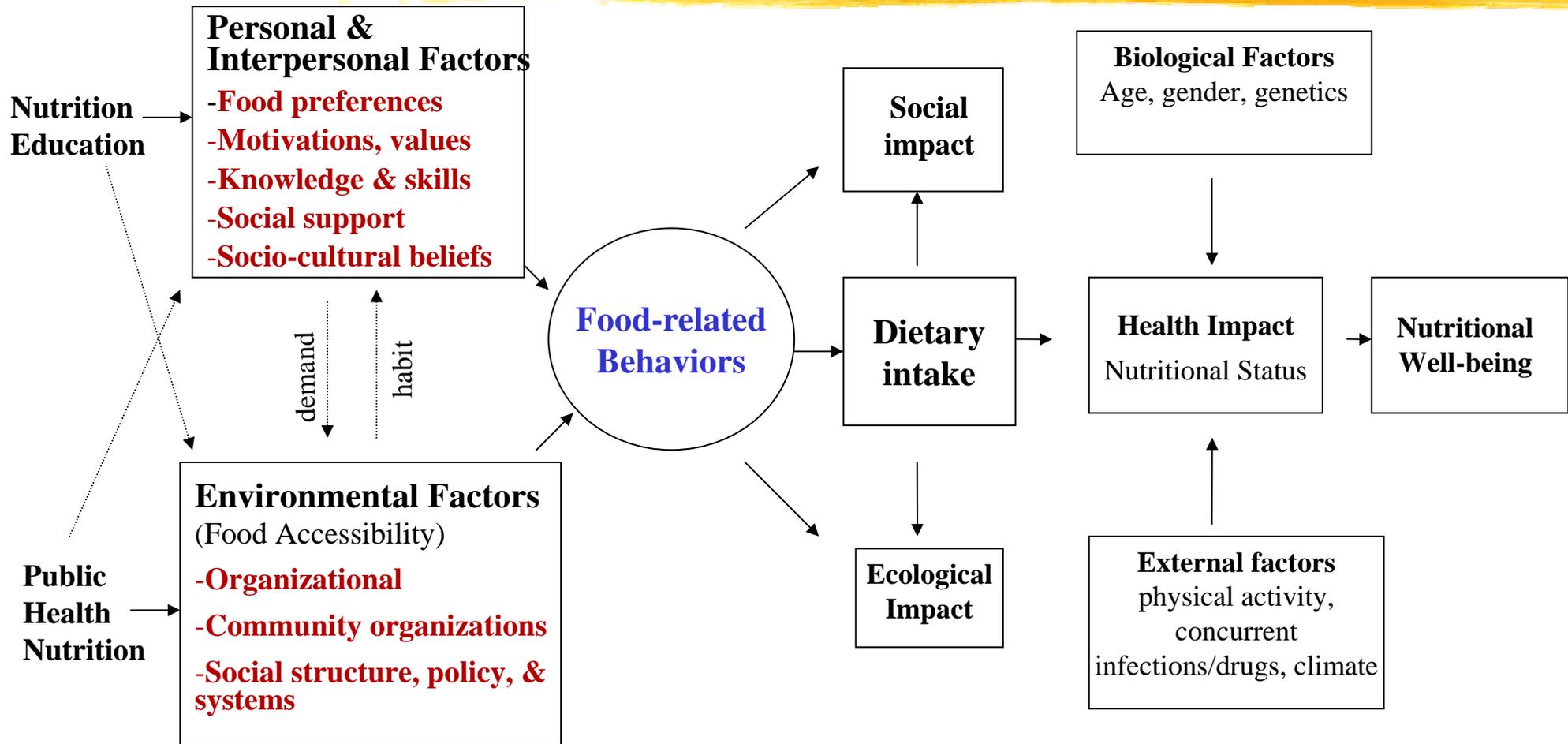
Intake measures

- Food frequency questionnaires
- Short checklists for fruits & vegetables; grains; fat

Some common measures

- BRFSS (CDC)
- 5 A Day (NCI)
- California Dietary Practices Survey
- Women's Health Trial FFQ
- Block Health Habits & History Q (NCI)
- Quick Check for Fat (McClelland, Keenan, Lewis et al., JNEB, 2001)

Factors influencing nutritional well-being and role of nutrition education



Outcome evaluation measures



Importance of Behaviors as Outcomes is increasingly recognized

Pioneering work of Kristal & colleagues:

- **Kristal, Shattuck, Henry. JADA 1990**
- **Shannon, Kristal, Curry, Beresford. Cancer Epid Biomarkers Prev. 1997**

Outcome evaluation measures

Behaviors (68 studies)

Self-report of trying recommended behaviors (1 study)

Checking and knowing own cholesterol level (3 studies)

Eating patterns/behaviors (14 studies)

Food preparation practices (2 studies)

Purchase of fruits and vegetables (1 study); low-fat items (2 studies)

Sales of specific items in cafeteria/vending machines /restaurants (9 studies)

Sales of specific items in grocery stores (12 studies)

Data to 1999 (Contento et al., JNEB, 2002)

Opportunities & challenges



Many behaviors addressed in Network programs:

- **Fruit & vegetable intakes: color your plate**
- **Physical activity**
- **Trying new foods**
- **Increased calcium intake**
- **Eating breakfast**
- **Make half your grains whole**
- **Read food labels**
- **More meals from scratch**

Outcome evaluation measures



- No magical solutions to outcome evaluation dilemmas
- Creative programs, creative solutions
- New tools or new ways of administering existing tools may need to be explored

Outcome evaluation measures



New formats

- **Activity-based for children instead of standard tests; pictorial formats, web-based**

New measures

- **Need to be validated; reliability established with audience**

Evaluating the Validity & Reliability of a Tool

Selecting □Items for a Food Behavior Checklist for a Limited-Resource Audience

Townsend, Kaiser, Allen, Joy, Murphy.

J Nutr Educ & Beh 2003; 35: 69-82

- Face validity; Cognitive testing
- Content validity
- Criterion validity
- Sensitive to change
- Reliability

Evaluating the Validity of Measurement Tool



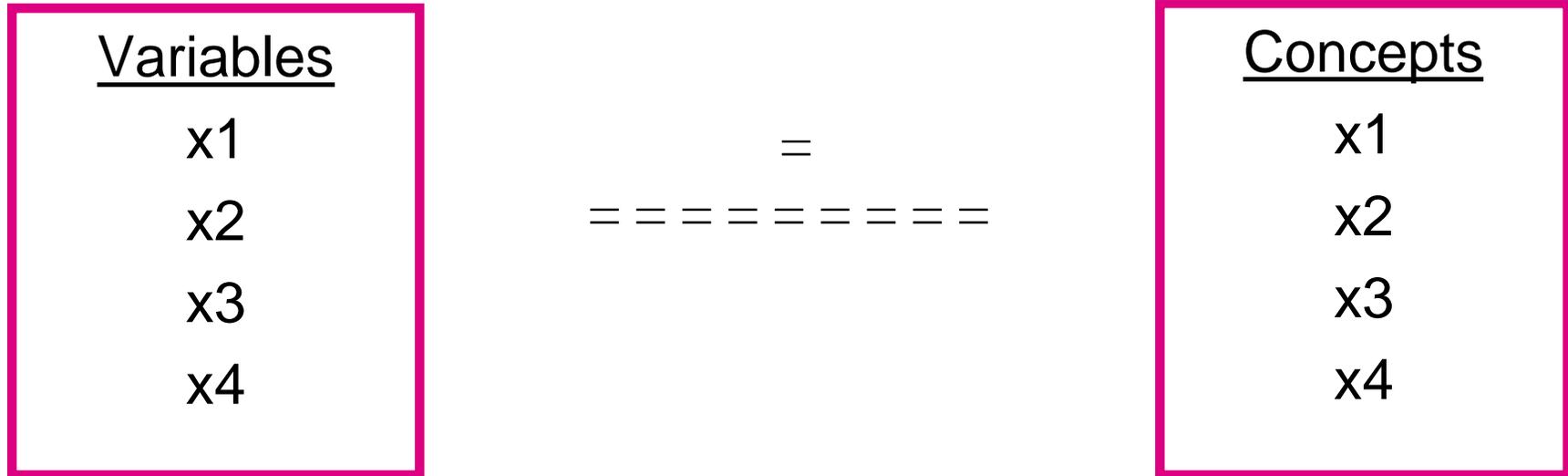
Face Validity

- Face validity
- Cognitive testing

Evaluating the Validity of Measurement Tool

Content Validity

Extent to which measures adequately represent concept



Evaluating the Validity of Measurement Tool

Construct Validity

Extent to which relationships between measures agree with relationships predicted by theories or hypotheses

Observed Relationships

+
x1 + + + + x1'
0
x1 + + + + x2
0
x1 + + + + x3
+
x1 + + + + x4

=
== == == == == == == ==

Theoretical Relationships

+
x1 + + + + x1'
0
x1 + + + + x2
0
x1 + + + + x3
+
x1 + + + + x4

Evaluating the Validity of Tools

Criterion Validity

Extent to which measure predicts or agrees with
criterion indicator of concept

Predictive or Concurrent

Variables
x1

r
+ + + + + + + + + +

Criterion
x1'

Where r = correlation
coefficient

Evaluating the Reliability of Tools

■ Test/Retest Reliability

Correlation between answers to same questions at different points in time

■ Inter-Rater Reliability

Correlation between answers to same questions obtained by different data gatherers

■ Internal Consistency Reliability

Correlation between answers to different questions about the same concept

Opportunities & challenges

Challenges for evaluation

Many behaviors addressed in the Network programs

Yet:

Reporting of impact is stronger when there is state or national evidence

Solution

Diversity and commonality?

Some core behaviors for all programs, with other behaviors that differ by state, local community?

Outcome evaluations



- **Appropriate match between intervention/
program objectives and measurement tools**
- **Measures need to be appropriate for duration &
intensity of intervention**
- **Control/comparison group**
- **Monitor what else is going on -- environmental
noise**
- **Tracking over time**

Outcome evaluations



- **Creative ways of capturing the data generated:
On-line web-based reporting processes**
- **Design ways to link process to outcome**
- **Partnering with other surveys or evaluations
being conducted**
- **Partner with academic institutions with on-
going research**

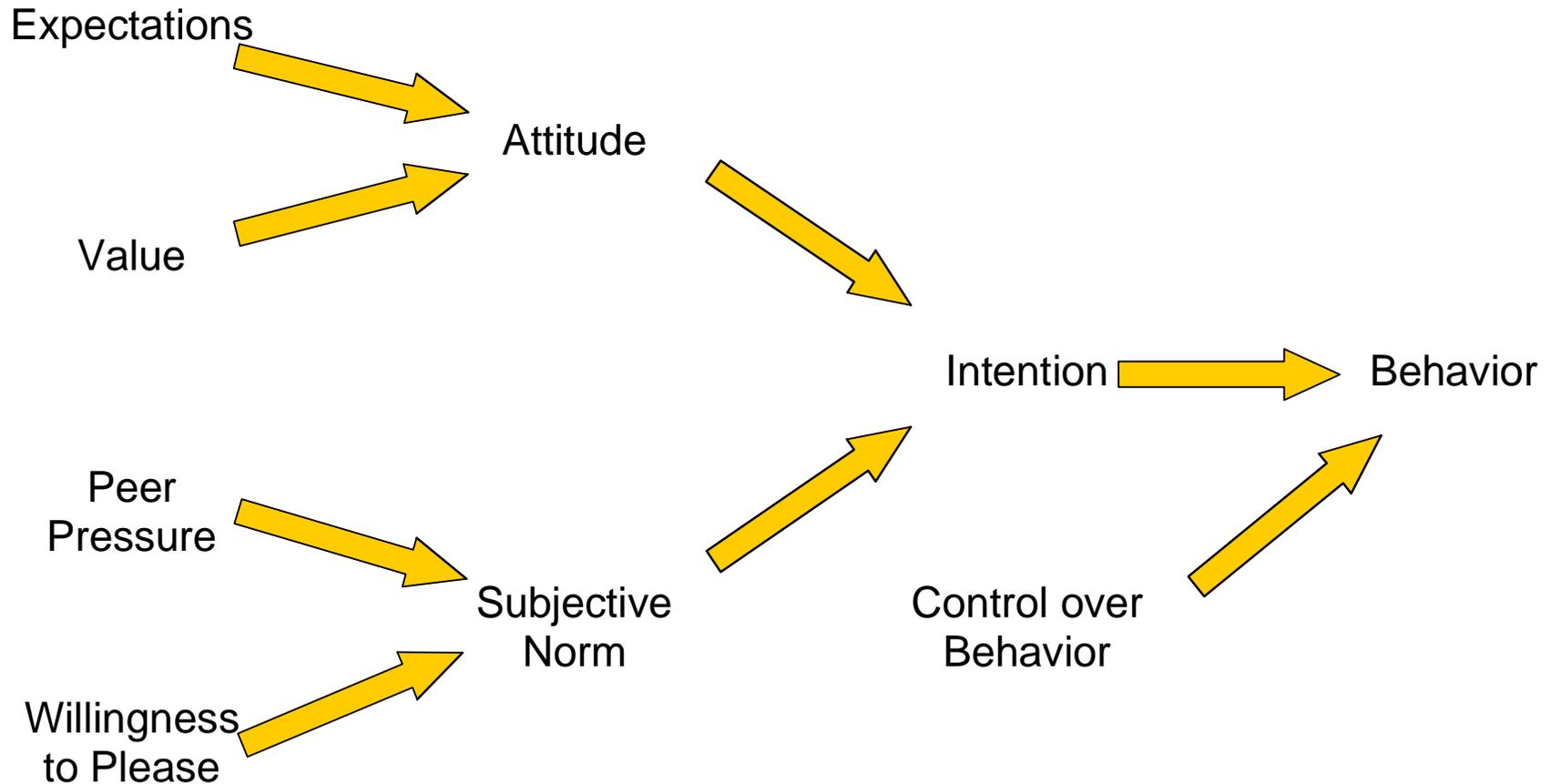
Outcome evaluations



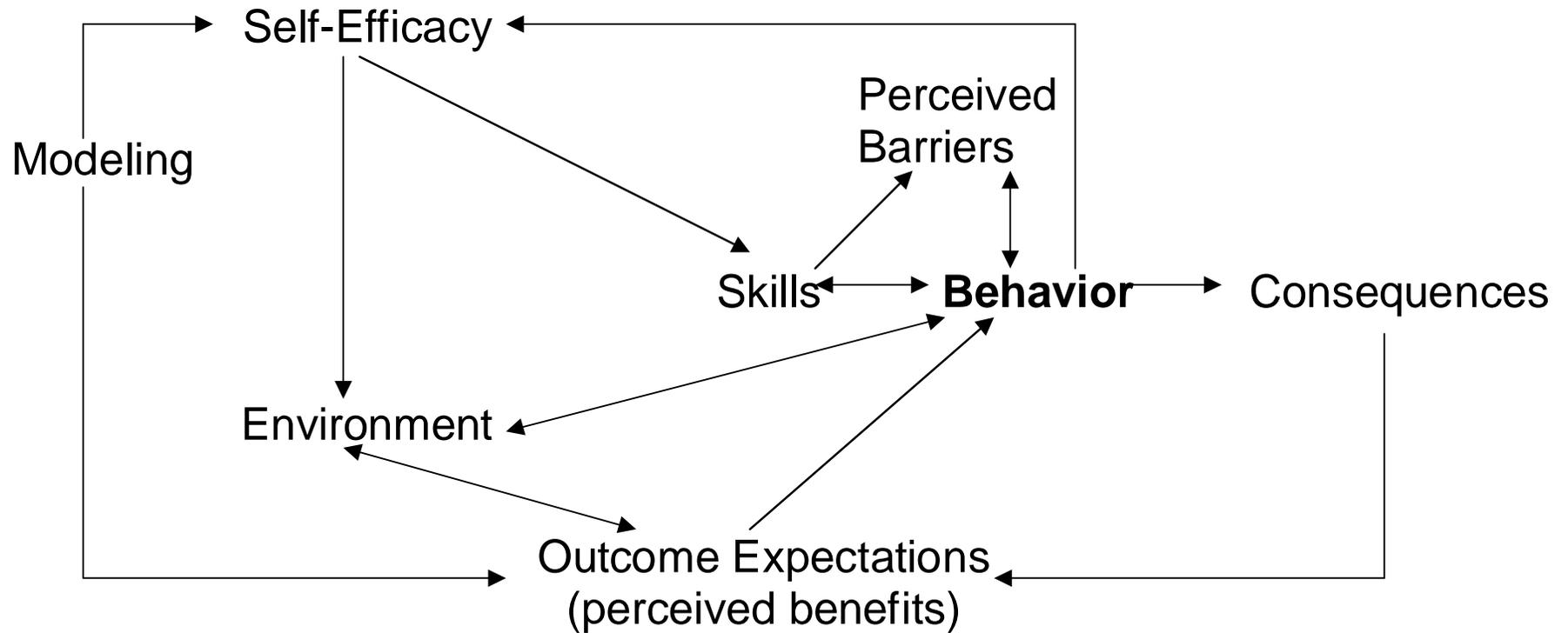
Measuring mediating variables is still important:

- Keeps your program honest in being not only behaviorally focused but theory-based
- May provide you with information that will help explain why your intervention is or is not working

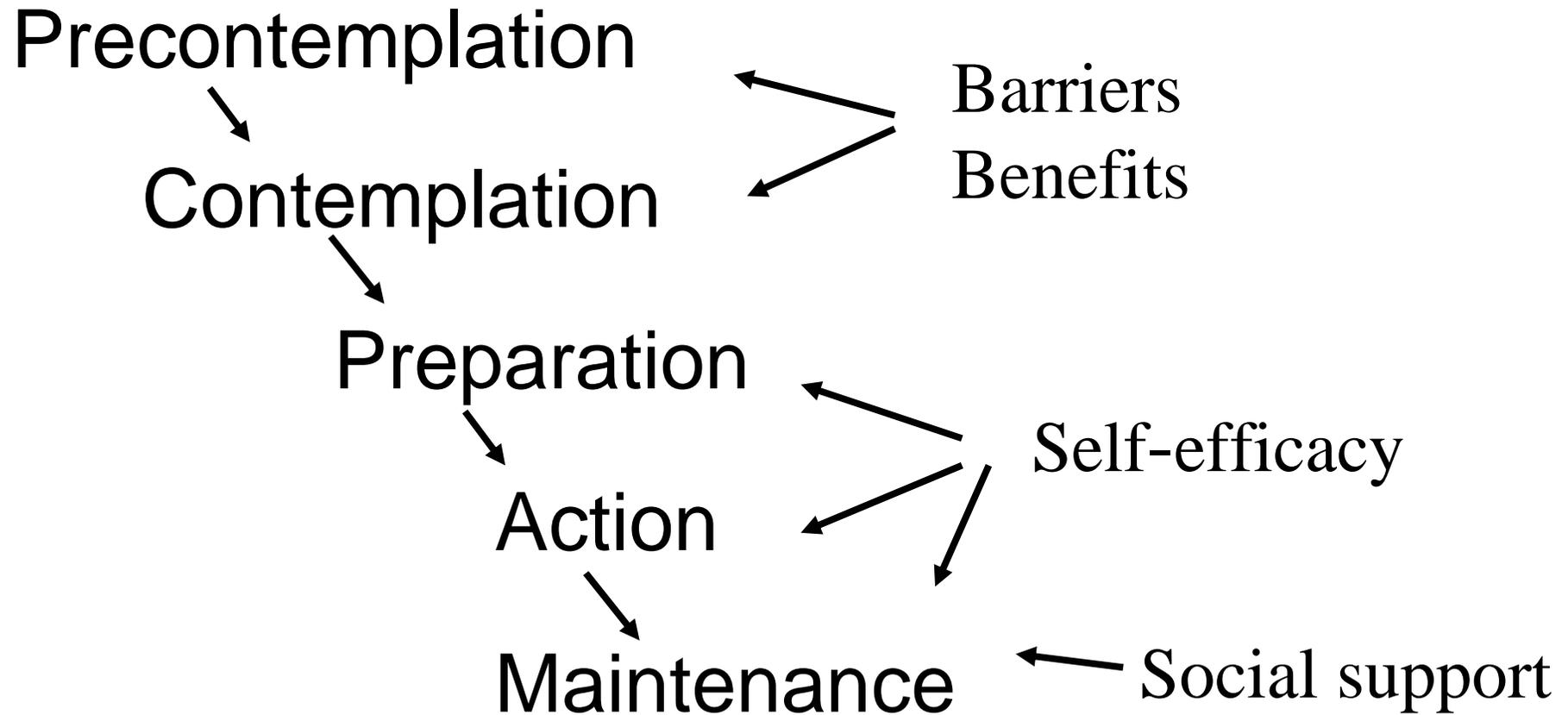
Theory of Planned Behavior (TPB)



Social Cognitive Theory



Stages of Change



Outcome evaluation measures

Psychosocial variables (20 studies)

- **Attitude toward healthy eating/specific concerns (8 studies)**
- **Beliefs/outcome expectancies (4 studies)**
- **Preferences (1 study)**
- **Self-efficacy (11 studies)**
- **Social influences/social support (5 studies)**

Data to 1999 (Contento et al., JNEB, 2002)

Outcome evaluation measures

Psychosocial variables

(currently most often measured)

- **Attitudes - general;**
 - towards low- fat; fruits & vegetables
- **Outcome expectations (beliefs)**
- **Self-efficacy**
- **Barriers**
- **Social norm/social modeling/social support**
- **Others depending on the theoretical framework**

Outcome evaluation measures

Environmental Changes

An important component of nutrition education

■ **Organizational climate (2 studies) (Data to 1999)**

■ **Challenge for the future:**

Measuring the impacts of environmental change:

- ◆ **Institutional level**
- ◆ **Community level**
- ◆ **State level**